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EXAMINER	
NG, CHRISTINE Y	

ART UNIT	PAPER NUMBER
2663	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/755,530	SCHMUTZ ET AL.	
	Examiner	Art Unit	
	Christine Ng	2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 January 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,6 and 8-20* is/are rejected.

7)☒ Claim(s) *4 and 7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 January 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3&5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 10, 16 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,029,162 to Epps.

Referring to claim 1, Epps discloses in Figure 1 a method of automatic gain control on a time slot by time slot basis in a receiver module employed in a communication system having a plurality (32) of time slots within a time frame. Refer to Column 3, lines 15-25. The method comprises the steps of:

Measuring an amplitude (V_{RMS}) of a signal on a given time slot among the plurality (32) of time slots for a predetermined number (48) of prior time frames to provide at least one amplitude value (V_{RMS}) per given time slot. For each of the 32 time slots, the RMS meter (Element 50) calculates a running root-mean-square (V_{RMS}) level of the input for a measurement period of 48 samples per time slot. Refer to Column 3, lines 61-66 and Column 4, lines 18-28.

Storing the at least one amplitude value (V_{RMS}) and associated time slot information and determining an appropriate gain adjustment factor for the given time slot. The RMS meter (Element 50) sends the V_{RMS} to the AGC look-up table (Element 80) to store. The "current signal amplitude V_{RMS} is used to determine the current gain

setting" (Column 10, lines 40-47). The "look-up table 80 is constructed...to implement gain rules by comparing the previous gain setting over lines 74 to the gain as determined by the received RMS level on line 52 and adding 1 db to increment gain or subtracting 1 db to decrement gain" (Column 10, lines 63-68).

Applying the gain adjustment factor to at least one received signal in a current time slot (V_{t-T}) of the given time slot, wherein a respective gain adjustment factor for each given time slot is applied to a plurality of current time slots within the time frame on a time slot by time slot basis. The previous gain settings from lines 74 are used to determine the gain setting of the current time slot (V_{t-T}) of the given time slot. Refer to Column 10, lines 48-58 and Column 11, lines 38-50. The procedure is done for all 32 time slots. Refer to Column 3, lines 61-66 and Column 5, lines 5-8.

Referring to claim 2, Epps discloses that the step of measuring further comprising the step of measuring the amplitude (V_t) of a plurality (48) of signals on a given time slot. Refer to Column 4, lines 7-28 and Column 8, lines 21-30.

Referring to claims 10 and 19, Epps discloses in Figure 1 a method for controlling the amplitude of at least one currently received TDMA signal (V_{t-T}) in a receiver module employed in a TDMA communication system having a plurality (32) of time slots. Refer to Column 3, lines 15-25. The method comprises the steps of:

Storing amplitude values (V_t) and associated time slot (TS1-TS32) information determined from at least one previously received TDMA signal, the at least one previously received TDMA signal arriving during at least one earlier frame. As shown in

Figure 3, a memory holds 48 samples of each of the 32 time slots. Refer to Column 5, lines 5-8.

Determining from the stored amplitude values (V_t) and associated time slot (TS1-TS32) information an appropriate gain adjustment factor for each of the plurality of time slots. For each of the 32 time slots, the RMS meter (Element 50) calculates a running root-mean-square (V_{RMS}) level of the input for a measurement period of 48 samples per time slot. Refer to Column 3, lines 61-66 and Column 4, lines 18-28. The "current signal amplitude V_{RMS} is used to determine the current gain setting" (Column 10, lines 40-47). The "look-up table 80 is constructed...to implement gain rules by comparing the previous gain setting over lines 74 to the gain as determined by the received RMS level on line 52 and adding 1 db to increment gain or subtracting 1 db to decrement gain" (Column 10, lines 63-68).

Detecting the at least one currently received TDMA signal (V_{t-T}), and applying respective ones of the appropriate gain adjustment factors to respective ones of the at least one currently received TDMA signals, wherein the appropriate gain adjustment factors are applied exclusively to the currently received TDMA signals occupying respective ones of the plurality of time slots. The previous gain settings from lines 74 are used to determine the gain setting of the current time slot (V_{t-T}) of the given time slot. Refer to Column 10, lines 48-58 and Column 11, lines 38-50. The procedure is done for all 32 time slots. Refer to Column 3, lines 61-66 and Column 5, lines 5-8.

Referring to claim 16, Epps discloses that the gain adjustment factors are determined by averaging amplitudes of at least one previously received TDMA signal

arriving during the at least one earlier frame. The gain adjustment factors are determined from the V_{RMS} value, which is a root-mean-square of 48 previous samples per time slot. Refer to Column 3, lines 61-66 and Column 4, lines 18-28.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 6,028,886 to Koga et al, and in further view of U.S. Patent No. 5,184,349 to Riordan. Epps does not disclose that the step of applying the gain adjustment factor further comprises the step of applying a respective gain adjustment factor for each given time slot across a plurality of radio frequency carriers occupying each given timeslot.

Koga et al disclose that when a system allows a plurality of devices to share a system, the system can assign several carrier frequencies per time slot. Refer to Column 2, line 60 to Column 3, line 2. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that a timeslot accommodates a plurality of radio frequency carriers; the motivation being that this allows several devices to share a single time slot, thereby saving channel bandwidth and accommodating more users per time frame. Epps and Koga et al do not disclose that the gain adjustment factor for each given time slot is applied across the plurality of

RF carriers in each time slot. Riordan discloses that a given timeslot within a TDMA frame is occupied by the same mobile user for consecutive frames, and that these frames experience a small amount of variation from one TDMA frame to the next. Refer to Column 1, lines 26-41. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the gain adjustment factor for each given time slot is applied across the plurality of RF carriers in each time slot; the motivation being that there is a small amount of variation in the reception power from frame to frame, so that the same gain adjustment factor can be applied to the same time slot, thereby maintaining a consistent reception signal.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 5,091,725 to Gard. Epps does not disclose the step of immediately attenuating high strength signals upon initial receipt and detection of high strength signals notwithstanding the gain adjustment factor that may have been applied.

Gard discloses in Figure 2 that "regardless of whether device 64 provides gain or attenuation, an output of device 64 provides the modulation signal at an amplitude controlled by CPU 52" (Column 5, lines 29-32). The CPU (Element 52) "may reduce the transmitted signal level to extend battery life" (Column 5, lines 36-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the step of immediately attenuating high strength signals upon initial receipt and detection of high strength signal notwithstanding the gain adjustment factor that may have been applied; the motivation being that the system may need to

immediately attenuate the signal level when battery strength is weakening; thereby saving resources.

6. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 5,184,349 to Riordan.

Referring to claim 6, Epps does not disclose the step of maintaining the automatic gain control synchronous with a time slot burst.

Riordan discloses that a time slot burst may comprise of a random access channel RACH, which is used to initiate communication and traffic bursts. The RACH is a one-time event in that the base station does not have the benefit of advanced knowledge of the mobile's received signal level as in the case for traffic channels. The base station must therefore "acquire and hold the appropriate AGC state during the actual random access burst". In addition, it must "perform this function quickly so as to permit proper reception of the transmitted data and proper cannel equalization". Refer to Column 1, lines 42-49 and Column 2, lines 44-48. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the step of maintaining the automatic gain control synchronous with a time slot burst; the motivation being that the time slot burst may contain random access information that must be obtained quickly and accurately in order to permit proper reception of transmitted data and proper channel equalization.

Referring to claim 11, Epps does not disclose that the gain adjustment factors are applied during a guard period of the at least one currently received TDMA signal.

Riordan discloses that in a TDMA system, the received power level for a traffic

channel experiences only a small amount of variation from one TDMA frame to the next. However, consecutive timeslots within the frame, since they represent different mobile users, can be received at widely different levels. For each TCH time slot, the receiver's AGC system can utilize the gain adjustment of the previous time slot to determine its gain adjustment, which requires that gain adjustment occur during the guard period between time slots. Refer to Column 1, lines 26-41. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the gain adjustment factors are applied during a guard period of the at least one currently received TDMA signal; the motivation being that since received power levels fluctuate widely between time slots, an AGC system of the current time slot can use the gain adjustment of the previous time slot to determine a more accurate gain adjustment for itself during the guard interval.

7. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 6,115,591 to Hwang. Epps does not disclose the step of applying attenuation based on a higher gain detected in a diversity condition.

Hwang discloses in Figure 1 a space diversity receiver that applies attenuation (Element 102) based on a higher gain (lower signal-to-noise ratio) in a diversity condition. If the difference between the signal-to-noise ratios of signals S1 and S2 exceeds 13 db, the attenuator 102 attenuates the signal with the lower signal-to-noise ratio to improve the signal-to-noise ratio of the combined signal. Refer to Column 3, lines 5-14. Therefore, it would have been obvious to one of ordinary skill in the art at

the time the invention was made to include the step of applying attenuation based on a higher gain detected in a diversity condition; the motivation being that when two signals are received, the attenuation should be applied to the signal with the lower signal-to-noise ratio since it requires a higher gain; thereby improving the combined signal so that the receiver has enough reception power to accommodate both levels of signal-to-noise ratios.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 5,050,192 to Nawata. Epps does not disclose that the step of applying a gain adjustment factor comprises the step of adjusting an attenuator with reference to the burst timing of a received signal on the given time slot.

Nawata discloses in Figure 1 applying a gain adjustment factor using an AGC circuit (Element 7) by comparing that input power level with a reference value, and then sending the factor to a gain control signal hold&control circuit (Element 8). Refer to Column 3, lines 34-43. Once a unique word is detected in a time slot, the hold&control circuit (Element 8) outputs the held gain control signal. In response to the gain control signal, the variable attenuator (Element 9) controls the amount of attenuation of the input signal. Refer to Column 4, lines 51-68. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the step of applying a gain adjustment factor comprises the step of adjusting an attenuator with reference to the burst timing of a received signal on the given time slot; the motivation being that since reception power at a central station greatly different from one burst to

another, by adjusting the attenuator only when it receives a unique word representing a specific user the central station is serving, reception power levels can remain more constant among users.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 5,184,349 to Riordan, and in further view of U.S. Patent No. 6,456,606 to Terasawa. Epps and Riordan disclose the gain adjustment factors are applied during guard periods. However, Epps and Rioradan do not disclose that GPS timing information is used.

Terasawa discloses that GPS is a reliable universal time reference used in wireless systems that can provide near-perfect synchronization. Refer to Column 1, lines 42-46 and Column 7, lines 22-27. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include using GPS timing information to time synchronize application of gain adjustment factors to guard periods; the motivation being that GPS is a reliable universal time reference that can provide synchronization down to the microsecond and nanosecond range, thereby facilitating extremely accurate timing for time-sensitive wireless systems.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 5,251,216 to Marshall et al, and in further view of U.S. Patent No. 6,317,435 to Tiedemann et al. Epps does not disclose the step of supplying the appropriate gain adjustment factors to a signal processor responsible for determining a RSSI for each of the at least one currently

received TDMA signal, whereby the BTS may consider the gain adjustment factors in determining a signal power for a transmitting mobile to use.

Marshall et al discloses in Figure 2 a AGC receiver comprising the step of supplying the appropriate gain adjustment factors (from gain amplifiers 12, 14 and 16) to a signal processor (Element 34) responsible for determining a RSSI for each of the at least one currently received TDMA signal. A signal of a current time slot is sent to gain amplifiers 12, 14 or 16 depending on the amount of gain needed which is derived from the gain of previous signals of previous time slots. The adjusted signal is then sent to RSSI unit 34 to measure its signal strength. Refer to Column 3, lines 6-43. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the step of supplying the appropriate gain adjustment factors to a signal processor responsible for determining a RSSI for each of the at least one currently received TDMA signal; the motivation being so that the RSSI of the signal, having already been attenuated or amplified, can be measured. The RSSI provides a measured power of the received signal, which can be used by the receiver in adjusting its power level for receiving future frames. Epps and Marshall et al do not disclose the BTS may consider the gain adjustment factors in determining a signal power for a transmitting mobile to use. Tiedemann Jr. et al disclose that the amount of power required in a system depends upon factors such as the gains of the antennas at the receiving station. Refer to Column 1, lines 57-65. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the use of the gain adjustment factors in determining a signal power for a transmitting

mobile to use, the motivation being that the transmitter can adjust how much power to send data depending on the extent to which the receiver has to increase its signal strength, thereby allowing the transmitter to increase or decrease its power accordingly.

11. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 5,548,594 to Nakamura.

Referring to claim 14, Epps does not disclose that the step of detecting further comprises comparing an amplitude of the at least one currently received TDMA signal to a predetermined saturation threshold.

Nakamura discloses in Figure 1 that the step of detecting further comprises comparing an amplitude (envelope) of the at least one currently received TDMA signal (Reception Signal 120) to a predetermined saturation threshold (Reference Voltage Signal 140). The difference between the detected signal 130 and the reference voltage 140 is supplied to the variable gain amplifier 30 as a gain control signal 150 in order to keep the reception signal 120 at a constant level. Refer to Column 2, lines 33-46. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include comparing an amplitude of the at least one currently received TDMA signal to a predetermined saturation threshold; the motivation being to keep the currently received signal at a constant level as determined by the saturation level, thereby ensuring that the signal is received with enough reception power.

Referring to claim 15, Epps does not specifically disclose the step of applying an attenuation factor during a time slot of the at least one currently received TDMA signal if

an amplitude of the at least one currently received TDMA signal exceeds the predetermined saturation threshold.

However, Epps discloses applying an attenuation factor (1 dB) during a time slot of a received TDMA signal (V_{t-T}) if an amplitude of the previous TDMA signals exceeds the predetermined saturation threshold (previous gain from Element 74). The "look-up table 80 is constructed...to implement gain rules by comparing the previous gain setting over lines 74 to the gain as determined by the received RMS level on line 52 and adding 1 db to increment gain or subtracting 1 db to decrement gain" (Column 10, lines 63-68). If the RMS level is greater than the previous gain from Element 74, a new attenuated gain is outputted. Refer to Column 10, lines 54-58. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include applying an attenuation factor during a time slot of the at least one currently received TDMA signal if an amplitude of the at least one currently received TDMA signal exceeds the predetermined saturation threshold; the motivation being that if the received TDMA signal is greater than a threshold, it must be attenuated in order to not to exceed the constant level determined by the threshold which may lead a waste of resources.

12. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 3,958,213 to Scott et al. Epps discloses controlling the amplitude of received TDMA signals using the amplitudes of the at least one (48) previously received TDMA signal arriving during the at least one earlier frame. However, Epps does not disclose that IF envelope power values constitute the amplitudes of the signal.

Scott et al disclose in Figure 1 that an envelope detector (Element 22) produces an envelope signal (Element 22a) having an amplitude that is proportional to the instantaneous maximum amplitude of signals. Furthermore, the gain of a system is inversely proportion to the values of the envelope, with identical systems having similar envelope parameters. Refer to Column 3, lines 4-6 and lines 53-68 and Abstract. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that IF envelope power values constitute the amplitudes of signals; the motivation being that by using parameters from an envelope, which is similar between similar systems, the gain between identical systems can be more accurately controlled for "optimizing signal level and thus enabling better circuit discrimination" (Abstract).

13. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 6,028,886 to Koga et al, and in further view of U.S. Patent No. 6,370,386 to Williams. Epps discloses applying respective ones of appropriate gain adjustment factors to at least one currently received TDMA signal on a respective time slot. However, Epps does not disclose that the BTS

is a broadband BTS providing cellular service using a plurality of RF carriers and that each time slot contains a plurality of RF carriers.

Williams discloses that in a broadband base station, one transceiver supports multiple RF carriers per sector, wherein the RF carriers can be dynamically reconfigured to meet the changing traffic patterns of each of the sectors that the base station is serving. Refer to Column 3, lines 30-46. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the BTS is a broadband BTS providing cellular service using a plurality of RF carriers; the motivation being that broadband allows a system to support a wide band of frequencies to transmit information from multiple users at the same time; thereby increasing the efficiency of the system. Epps and Williams do not disclose that each time slot contains a plurality of RF carriers. Koga et al disclose that when a system allows a plurality of devices to share a system, the system can assign several carrier frequencies per time slot. Refer to Column 2, line 60 to Column 3, line 2. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that each time slot contains a plurality of RF carriers; the motivation being that this allows several devices to share a single time slot, thereby saving channel bandwidth and accommodating more users per time frame.

14. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,029,162 to Epps in view of U.S. Patent No. 5,852,412 to Strangeland. Epps does not disclose that the TDMA signals are synchronized to GPS timing for time slot bursts of RF carriers.

Strangeland discloses in Figure 2 that during transmission of data, the data is first modulated with a carrier using a Modulator Box (Element 110). The RF signal is then passed through a switch (Element 112) that is controlled to an on/off position by a GPS Time Box (Element 114) in order to synchronize the signal to the correct TDMA time slot. The signal is finally transmitted out through antennas (Elements 70, 74 and 80). Refer to Column 2, lines 44-61. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that that the TDMA signals are synchronized to GPS timing for time slot bursts of RF carriers; the motivation being that this allows the data to be accurately placed into its correct time slot at the correct time; thereby avoiding interference with its neighboring time slots that are carrying data to other users, since GPS offers an accurate timing schedule down to the microsecond and nanosecond level.

Allowable Subject Matter

15. Claims 4 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Ng whose telephone number is (703) 305-8395. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nguyen Chau can be reached on (703) 308-5340. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Ng cw
June 7, 2004

CHAU NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600